DM-280

Time Recording Terminal

User's Guide

Version 1.0

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DM-280 User's Manual

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I. INSTRODUCTION

The DM-280 OA Timeclock records and sends employees' entry/exit times and status to a host computer for further processing. This eliminate errors in manual data input/calculations and the redundancy of re-copying timecards. When used in conjunction with a payroll software application package, the entire time/attendance/payroll system is combined into one automatic process. Time and monetary savings are immediate.

The DM-280 is a state-of-the-art computerized OA Timeclock with multi-lingual capabilities. This unit introduces the RAM card option which allows the DM-280 to be used as a stand-alone unit with an off-line capacity up to10,000 records. RAM cards are collected from each unit periodically and the data downloaded to the host computer. This avoids the costly cable installation charges and allows great flexibility. The DM-280 can use a DC12V power source (like an auto cigarette lighter) and be used where there is no electricity. (e.g. construction sites, field work, etc..) It can also use RS-232/485 interfaces. The RS-485 interface allows networkability—up to 63 units can be connected to one host on the same line. This is ideal for factories or large buildings with multiple entrances. On-line or off-line, hard copy printouts of time and status of entry/exit can be made locally by connecting with the SP-190 Audit Printer or other type printers.

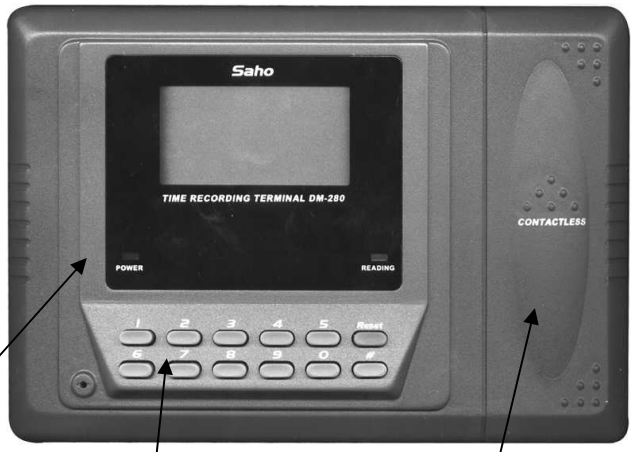
The DM-280 offers three types of user interfaces to suit the user need.

The three options available for display are:
DM-280 with a proximity reader
DM-280 with a magnetic striper reader
DM-280 with an IC card reader
DM-280 can connect with a larger 64x128 dot matrix display for graphic images necessary in Chinese and Japanese or in other non-Roman alphabets such as Arabic, Russian, Korean, Thai, etc. It can also be used for displaying mathematical symbols or user defined graphics.
This manual has been written for the model DM-280P.

A. APPEARANCE

DM280 WITH PROXIMITY READER

LCD DISPLAY



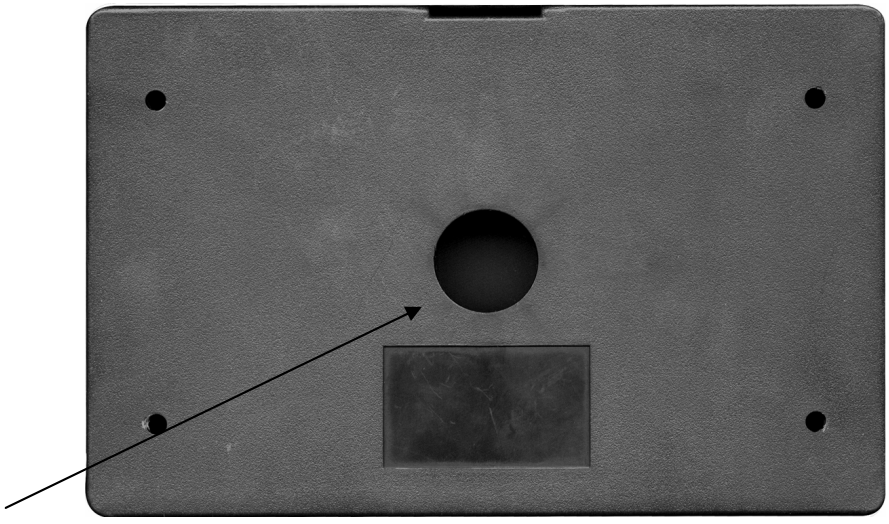
Power led **Keypad** **Proximity reader(Antenna)**

B. PHYSICAL DESCRIPTION OF DM-272T

Display: 8 lines of 16 characters each.

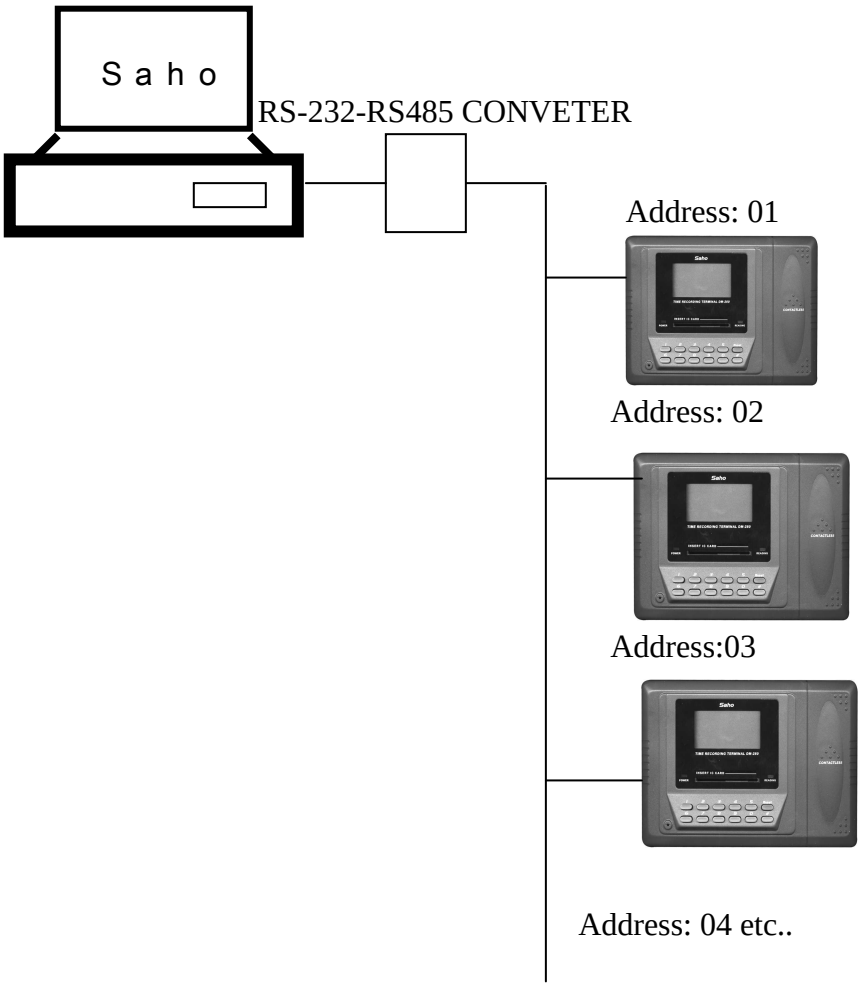
Keypad:	0- -9	Numeric keys
	1	'1' key is also used when changing parameters in master card operation
	#	Enter key
	reset	Reset key

C.BACK OF CHASSIS



Wiring outlet

D. RS-485 CONFIGURATION DIAGRAMS



II. SET-UP PROCEDURES

A. Installation

1. Make sure switching power supply is 12V DC, INNER "+"

2. Open the case and adjust DIP switches as per the following page. Connect printer (if required) to J5 on main board. Place jumper-pin (SW2) top on both connectors to initiate back-up battery to keep data and clock functions in the event of a power outage.

3. Plug in power-cord.

4. If the power is in DM280, will begin a cold start process. If you are doing a warm start (DSW2 set to ON in step 2) display will begin from step 8 below.

5. DM-280 performs a selftest .

```
Self test ...
```

6. If RAM is out of order, display will say so and unit will beep 3 times repeatedly. Check RAM (U4).

```
Self test ...
RAM(U4) Fail...
```

7. If DM-280 is in normal condition, LCD display will show

```
Self test ...
No Error
```

8. If RAM card is inserted in the unit, the LCD will display the size of the card which is inserted.

```
Saho  DM280  V1.0

M1024
```

9. The unit will next run a RAM card test. If there is an error, LCD will indicate "RAM CARD ERROR", otherwise the unit goes to next display massage.

```
Saho  DM280  V1.0

RAM  CARD  ERROR
```

10. Display shows data and time. This indicates the unit is ready.

```
***  DM-280  ***
   1999/07/01

Function  〔A〕
```

11. If a card is presented to DM280, the ID number of the card will be shown on the LCD Display, and stored in buffer with a long 'beep'. At the same time, if connected, the printer will print the number and time. If a RAM card is inserted in the unit the data will be first sent to and stored in the RAM card. If the card is full, the data will be set to and stored in the DM280's memory buffer. When the RAM card is full, LCD shows status and beeps. Remove it and replace with a new one (see RAM card section) Or retrieve it through serial communication. If there is remaining in the DM280's buffer, the LCD will Display "MOVE DATA TO RAMCAR" and will download the data to the New card.

12. If the DM280 sounds three short beeps, it means either:
    Wrong operation has happened upon card presenting, e.g. wrong key was pressed before sliding.

B. Parameters: Dip Switch settings

Set the parameters to suit your needs via the dip switches and the Master Card functions described below.

Note: When DM280 is turned on, it will start at status “A”. If DSW1 #6 is set to OFF, one must press “#” (Enter) on the keypad before changing the status manually to A, B, C, or D. If it is set ON, then one need only press the status key (1, 2, 3, 4).

To set hardware for RS-485 transmission, you need to use the Master card function 2(see below). Set DATA BIT to 8,PARITY to NO .

DSW1 settings (DSW1)

Situation	#1	#2	#3	#4	#5	#6	#7	#8
2 Digit address	ON							
3 Digit address	OFF							
RS-232		OFF	ON	OFF				
RS-485		ON	OFF	ON				
Send signal to open door					ON			
Doesn’t send signal to Open door					OFF			
Requires pressing ‘#’ Key before changing Status						OFF		
Doesn’t need pressing ‘#’ before changing status						ON		
Adds CR to printer							ON	
Doesn’t add CR to printer							OFF	
Printer ON								ON
Printer OFF								OFF

C. MASTERCARD-SETTING FUNCTIONS FROM DM-280S KEYPAD

1. Read MASTERCARD, display shows:

```
1.Set timer
2.Update Param.
3.Set Music
4.Clear Music
```

5．Set Func time

2. Key in 1 (2, 3, 4, 5) to do special function.

NOTE: If any key is pressed incorrectly, DM-280 will exit this function. DM-280 will scan keyboard for 25 seconds before returning to previous menu.

Programming	Function
1	set time
2	set transmission mode
3	set 30 music time
4	clear all music time which have been set
5	set function

1. Set Current Time

a. Read MASTERCARD and press '1' key.

b. Key in time (13 digits), following the format below. To change digits, first press '1' key, then key in correct digits. When correct press '#' key.

a. year: xxxx (4 digits)
b. month/date: xxxx (4 digits)
c. date: xx (2 digits)
d. weekday: x (1 digits) Sunday=1; Monday=1; Tuesday=2; etc.
e. hour/minute: xxxx (4 digits)

EG.: 1999 12 31 5 1200

1 9 9 9 1 2 3 1 5 1 2 3 0
Y Y Y Y M M D D W H H m m
P r e s s 〔1〕 f i r s t

c. Press "1" key to modify or re-keyin before finishing entry.

d. Press '#' key, display will return to main menu and show the current time and date.

Note: Adjustment VC1 of U2 (Real time clock IC: M6242B) for frequency correction. Use frequency counter to check IC's pin #1 or TP1 pole. Set

frequency to 1.000 Hz.

2. Set Transmission Mode

a. Read MASTERCARD and press ’2’ key.

b. Display indicates that the transmission mode is RS-485 (see above for DSW1 settings). To change this mode, press ‘1’ key and unit will cycle through 232 and 485. When it reaches the desired mode press ‘#’ key. (RS-485=CR-ON; Databit-8; Parity-NO.)

```
RS-                 485
```

c. Display next indicates the baud rate = 9600, press ‘1’ key to select the baud rate 9600, 4800, 2400, 1200. When correct press the ‘#’ key.

```
Baud Rate     9600
RS-                 485
```

d. Display next indicates the carriage return is ON. This means record data is attached with Carriage Return (0DH) when data is uploaded. If Carriage Return is not required, press ‘1’ key. When correct press the ‘#’ key.

```
CR                    ON
Baud Rate   9600
RS-                 485
```

e. Display will now indicate all data attached with LF code (0AH). If line Feed is not required, press ‘1’ key. When correct press ‘#’ key.

```
Line Feed       ON
CR                    ON
Baud Rate       9600
RS-                 485
```

f. Display will next show data bit status. As this is fixed, press ‘#’ key to

continue.

```
Data Bit          8
Line Feed        ON
CR               ON
Baud Rate     9600
RS-             485
```

g. Display will next show the parity status. If parity is not require, press ‘1’ key . Press ‘#’ key to continue.

```
Parity           NO
Data Bit          8
Line Feed        ON
CR               ON
Baud Rate     9600
RS-             485
```

h. Display will now show the ID length is 8 digits . Press ‘1’ key and key in 2 digits to change the length of ID number. The length of ID number can be from 1 to 16. When correct press the ‘#’ key.

```
Id length        08
Parity           NO
Data Bit          8
Line Feed        ON
CR               ON
Baud Rate     9600
RS-             485
```

** If buffer already had data present, this function is disabled and user may not modify it.

i. Display will now show the address code is 001. Press ‘1’ key and key in 3 digits to modify the address code. When correct press ‘#’ key.

Addr Code 001
Id length 08
Parity NO
Data Bit 8
Line Feed ON
CR ON
Baud Rate 9600

** If buffer already had data present, this function is disable and user may not modify it.

j. Display will next show the file number found on valid cards. To change the file number press ‘1’ key and modify the digits. Press ‘#’ key when finished.

1234567890123456
File NO. 001
Id length 08
Parity NO
Data Bit 8
Line Feed ON
CR ON
Baud Rate 9600

This function is reserved for magnetic stripe reader only.

3. Set 30 Music Times

a. Read MASTERCARD and press ‘3’ key.

Set Music Time
Pess 〔1〕 first

b. Press ‘1’ key and key in 4 digits (2 digits for hour and 2 digits for minute). Press ‘1’ key if you make a mistake and re-do. Press ‘#’ key to store the time into memory, and key in another time if required.

Set Music Time: Mon: 1230

c. Continue the procedure until the 30th music time has been set. If less than 30 music times are required, press ‘#’ two times to finish the work, DM-280 will return to main menu and the LCD will display current time.

4. Clear All Music Times Which Have Been Set

a. Read MASTERCARD and press ‘4’ key.

b. Display shows:

Clear Music ? Press〔1〕 first Then Keyin〔#〕

c. Press ‘1’ (SELECT) key and ‘#’ (ENTER) key.

5. Set Function Key Times to Change Automatically

The display of Function [A]~[D] are commonly set to signify entering and leaving workplace times and status, e.g. A= day shift in, B= day shift out, C= night shift out. These shift indicators can be set to change automatically when the appropriate time comes about. This setting can be manually overridden by simply pressing the appropriate button should one arrive late, or for other reasons.

a. Read MASTERCARD and press ‘5’ key.

b. Display shows “9999” which indicates that no time is presently set for function time A.

```
                    9999
Function 〔A〕
Press〔1〕first
```

c. To set a time for “A” arrow to be automatically lighted press ‘1’ (SELECT) key and key in the time for it to change. Then press ‘#’ (ENTER) key.

d. Display next shows function B, C, and D. Repeat procedure for b, c, and d—or just b if only two shifts are needed.

```
Fuction 〔A〕1230
```

NOTE: For the beginning of a shift, the arrow must be set to enter “A” earlier than when workers begin arriving for work, e.g. set A to 8:00 if work shift start at 8:30.

D. Temporary Card

In case an employee forgets to bring his ID card, do as follows:

1. Present temporary card. Display will show

```
Temorary Card:
Press(1) first
```

2. Press ‘1’ (SELECT) key.
3. Key in the employee’s ID number.
4. Press ‘#’ (ENTER) key.

Data will be stored in buffer with a long ‘BEEP’ and ID number will be displayed. Also, if connecting to a printer, it will print out this employee’s data. If wrong keys are pressed, during keying-in ID number, please press ‘1’ key to modify.

E. Data print-out format

If the DM-280 is connected with the SP-190 Audit Printer, or another alpha-numeric printer, the following data will be printed out upon reading a card.

a. 2 digit address:

A> 0100000001 12-05 10/01

1 2 3 4 5

1. Function status A, B, C, or D
2. 2 digit address (DSW1 #6 is OFF)
3. 8 digit ID; if number is greater than 8 digits, time and date will be printed on second row.
4. 4 digits of time
5. 4 digits month/date

b. 3 digit address:

A00100000001 12-05 10/01

1 2 3 4 5

All elements are the same as in 2 digit address except for #2 which now shows the three digit address.

F. ID CARD

1. Present ID CARD, CARD NO. will show on DM-280's LCD display
2. ID NO. will be printed out from printer
3. DM-280 will transmits the CARD NO. via the transmission interface.

SOH + ADDRESS + ID +CHKSUM + CR (0DH)

3 2 8 1 1

EXAMPLE: Address no.=01, ID=00000003 , CHKSUM=02H

01H, 01H, 01H, 30H, 31H, 30H, 30H, 30H, 30H, 30H, 30H, 30H, 33H, 02H, 0DH

III. RS-232/RS-485 COMMUNICATIONS

For instructions on how to use the DM-280 on-line to your PC with the supplied software program, please consult the DM-280 Learning Kit. Below the hardware configuration and details on communication protocol necessary for programmers are explained when developing application programs.

A: RS-232 Communications Hardware Set-up

1. User must make and connect a cable between PC and DM-280 as per the following specifications.

Connect between T1 terminal inside DM-280 and IBM PC or compatible:

Definition as follows:

T1		PC(D-TYPE 25 PIN)
(RXD) PIN # 10	←	PIN # 2 (TXD)
(TXD) PIN # 9	→	PIN # 3 (RXD)
(GND) PIN # 8	← →	PIN # 7 (GND)
		PIN # 4, # 5 shorted
		PIN # 6 # 20 shorted

T1		PC (D-TYPE 9PIN)
(RXD) PIN # 10	←	PIN # 3 (TXD)
(TXD) PIN # 9	→	PIN # 2 (RXD)
(GND) PIN # 8	← →	PIN # 7 (GND)
		PIN # 1, # 4,#6 shorted
		PIN # 7, # 8 shorted

2. Set DSW1: #2=OFF, #3=ON, #4=OFF.
3. RS-232 is viable up to 15.2 M (50ft.) according to EIA standards. Voltage should be +3--+15V for logic lower level. Do not exceed +25V.

B. RS-232 Communications Parameters

DEFAULT CONDITION MODE	VALUE	Setting

Baud rate	9600	(Selectable)
Carriage return	ON	(Selectable)
Line feed	OFF	(Selectable)
Data bit	7	(Selectable)
Parity bit	No	(Selectable)
Id length	08	(Selectable)
Address code	001	(Selectable)
Communication port	232	(Fixed)
File number*	1234567890123456	(Selectable)

*** For magnetic stripe reader only**

C . Hardware Set-up for RS-485 Communications

1. When using under RS-485, DSW1 should be set #2 ON, #3 OFF, #4 ON.
2. Connections between T1 terminal inside the DM-280 and IBM PC or compatible are as follows:

T1			RS-485 Converter
(TXD+)	PIN#4	→	PIN#7 (RXD+)
(TXD-)	PIN#5	→	PIN#8 (RXD-)
(RXD+)	PIN#6	←	PIN#1(TXD+)
(RXD-)	PIN#7	←	PIN#2(TXD-)

*FOUR-WIRE RS-485 can convert to two-wire type by parallel TXD+/RXD+ and TXD-/RXD- respectively.

3. RS-485 is viable up to 1219m (4000ft.) according to EIA standards. Voltage should be kept from –7V--+12V. Up to 63 units (w/same communications protocol) can be on the same line to the host.

4. For use with RS-485, a converter is available from Saho which allows use of the RS-232 port on your PC.

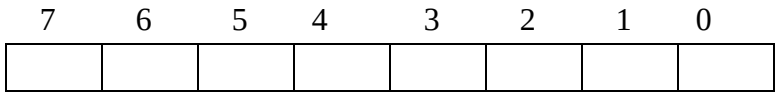
D. RS-485 Communications Parameters

CONDITION MODE	DEFAULT VALUE	S/F
Baud rate	9600	(selectable)
Carriage return	ON	(selectable)
Line feed	OFF	(selectable)
Data bit	8	(Fixed)
Parity bit	NO	(Fixed)
Id length	8	(selectable)
Address code	001	(selectable)
Communication port	485	(Fixed)
File number*	1234567890123456	(selectable)

* For magnetic stripe reader only.

E. **RS-232/RS485 Communications Data Format**

1. Byte Contents



The two most significant bits of each byte (bits 7 and 6) have the following definition:

00 (00H) signifies DM-280's address 1

01 (40H) signifies DM-280's address 2

10 (80H) signifies Data (data 1…data n)

11(C0H) signifies Check sum.

2. Contents of Data Packets for RS-232/RS-485 Communications

The packet includes at least the following bytes: address 1 byte, address 2 bytes, data bytes and checksum byte. Each byte contains 2 bits of token (as explained above) and 6 information bits.

00	Address1	+	01	Address2	+	10	Data1	…	10	Data n	+	11	Checksum

3. Conversion Method for Data Sent from PC to DM-280

Data field byte =[(ASCII Code-20H) AND 3FH] OR 80H

Example:

Command ‘A’ (41H)

41H-20H =21H

21H AND 3FH=21H

21H OR 80H= 0A1H

Note: Range of acceptable ASCII Code is from 20H—5FH.

4. Format for Calculating Check Code

Check sum = (address 1 XOR address 2 XOR data 1 XOR…XOR data n) AND 3FH OR C0H

5. Commands

The command must be placed as the first byte in the data field.

6. Format of Data Returned form DM-280

SOH	SOH	SOH	D1 ….Dn	Check Code	CR

SOH (Start of heading) =01H

CR =0DH

Check Code = D1 XOR…..XOR Dn XOR (Note: if result =0DH, 0AH or

1AH the unit automatically adds 40H to prevent confusion over the end of packet.)

F. Examples of RS-232/RS-485 Communications Conversions

1. Address = 01

Command A 1H, 41H, A1H, E1H

Command O 1H, 41H, AFH, EFH

Command C 1H, 41H, A3H, E3H

Command T 1992090451200 ----------1H, 41H, B4H, 91H
99H, 99H, 92H, 90H
90H, 94H, 95H, 91H
92H, 90H, 90H, ECH

2. Address = 02

Command A 2H, 42H, A1H, E1H

Command O 2H, 42H, AFH, EFH

Command C 2H, 42H, A3H, E3H

Command T 1992090451200 ---------- 2H, 42H, B4H, 91H
99H, 99H, 92H, 90H
90H, 94H, 95H, 91H
92H, 90H, 90H, ECH

G. Command Overview

A Command: Ask device state of data

C Command: Receive one data record from device

O Command: Increment pointer flag

T Command: Set time data to device

E Command: Ask time data from device

M Command: Set music/alarm times

K Command: Delete all music times

L Command: Set times for activation of each function key

S Command: Send a message to DM-280's LCD display

H. DM-280 RS-232/RS-485 Commands

SOH = (01H)

CR = (0DH)

CHK = CHECK SUM

RES = RESERVED CODE

1. A COMMAND: Ask a device the state of data

HOST DM-280

Command A (41H) →

← SOH "n" (ASCII) CHK CR

3 1 1 1

Def: 3 digits of SOH (01H)

1 digit reply data

n = 0 (30H) = Data present

n = 1 (31H) = No data present

1 digit check code (format = D1 XOR…..XOR DN)

1 digit CR (0DH)

2. C COMMAND: Receive one data record from device

HOST DM-280

Command C (43H) →

← SOH ADDR ID RES TIME DATA FUN SEQ CHK

3 2 or 3 8 1 4 4 1 1 1

Def: 3 digits of SOH (0H)

2-3 digits of address. Use DSw1. #1 to set.

1—16 digits ID length. Use Mastercard function 2 to set.

1 digit reserved

4 digits time HR, Min. e.g. 1200=31H, 32H, 30H, 30H

4 digits date Mon., Date. e.g. 05 06 = 30H, 35H, 30H, 36H

1 digit function time e.g. A= 41H, B=42H, C=43H, D=44H

1 digit sequence code used to prevent duplication of data.

1 digit check code (format = D1 XOR….XOR DN)

1 digit CR (0DH)

3. O COMMAND: Increment pointer flag

HOST DM-280

Command O (4FH) →

← SOH CTL-D (04H) CHK CR

3 1 1 1

If CTL-D (0DH) is returned, pointer incremented; if no answer, failure in incrementing pointer.

4. T COMMAND : Set time data to device

HOST DM-280

Command T (54H) + YYYYMMDDWHHmm→

← SHO “G”(47H)or “B”(42H) CHK

CR

3 1 1 1

Definition of 13 digits of Date/time:

YYYY= year (1993)

MMDD= Month/Date (04/30)

W= Day of week; 0=Sun, 1=Mon, 2=Tues. etc.

HHmm= Hour/Minute (12 00)

“G” (47H) = Good (successful); “B” (42H)= Bad (unsuccessful)

5. E COMMAND : Ask time data from device

HOST DM-280

Command E (45H)

SOH YYYYMMDDHHmm CHK CR

3 13 1 1

6. M COMMAND: Set music/alarm times

HOST DM-280

Command M+WHHmm→

← SOH “G” or ”B” CHK CR

3 1 1 1 1

W= Day of week; 0=Sun, 1=Mon, 2=Tues. etc. , HHmm=Hour/Minute.)

“G” (47H)=Good (successful); “B”(42H)=Bad (unsuccessful)

7. K COMMAND: Delete all music times

HOST DM-280

Command K (48H)→

← SOH “G” CHK CR

3 1 1 1

“G” (47H)= Good (successful); “B”(42H)= Bad (unsuccessful)

8. L COMMAND: Set times for activation of each function key

HOST DM-280

Command L (4CH)+ HHmmHHmmHHmmHHmm →

← SOH “G” or “B” CHK CR

3 1 1 1

Definition:

First HHmm (4 digits) = Time (hour/min.) DM-280’s function LED will change to “A”

Second HHmm (4 digits) = Time (hour/min.) DM-280’s function LED will change to “B”

Third HHmm (4 digits) = Time (hour/min.) DM-280’s function LED will change to “C”

Fourth HHmm (4 digits) = Time (hour/min.) DM-280’s function LED will change to “D”

Response definition:

“G” (47H) =Good (successful); “B”(42H) =Bad (unsuccessful)

9. S COMMAND: Show a message on DM-280’s display

COMMAND S(4CH)+YXNNCCC……C

Total number: NN

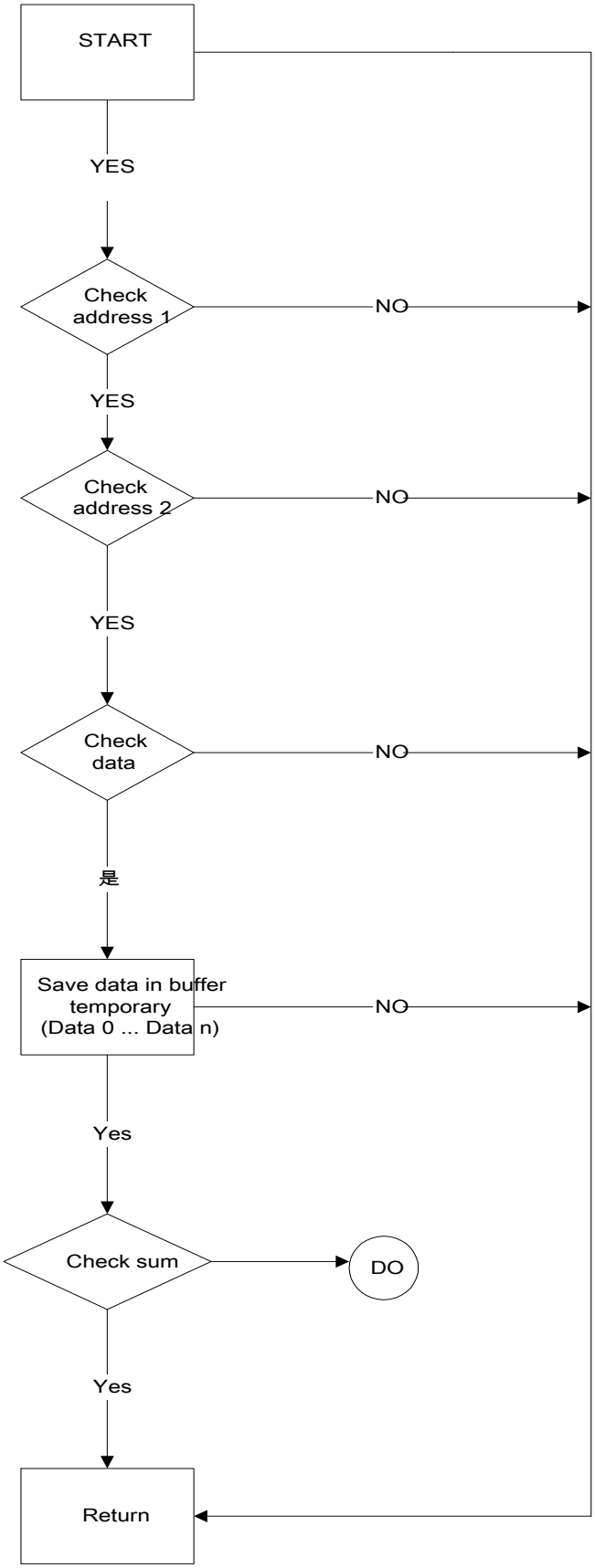
X: LCD’s column number (hexadecimal: 0-F)

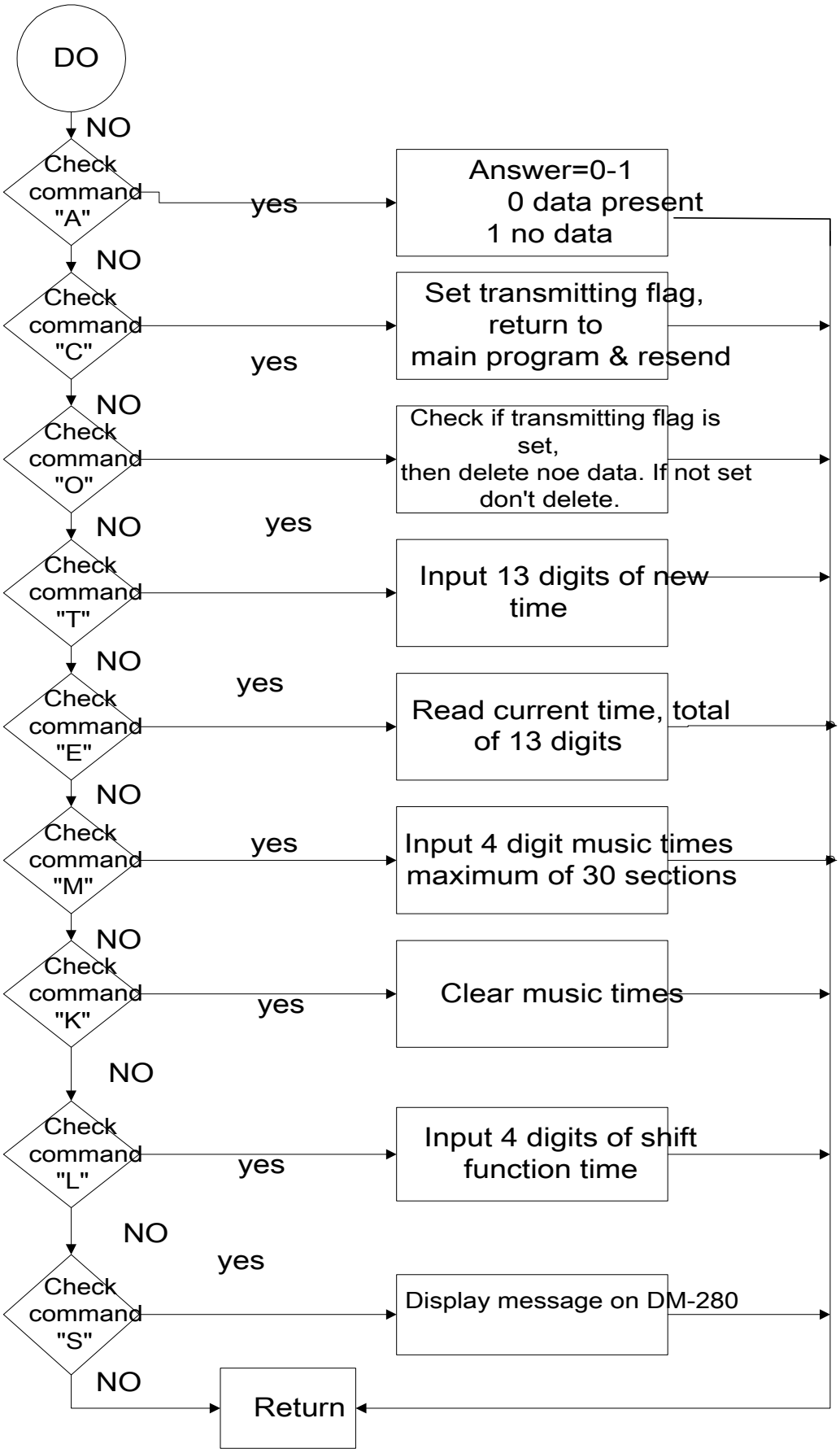
Y: LCD’s row number (decimal: 0-7)

NN: total number of characters (decimal: 01-99)

C : required character to the DM-280 display

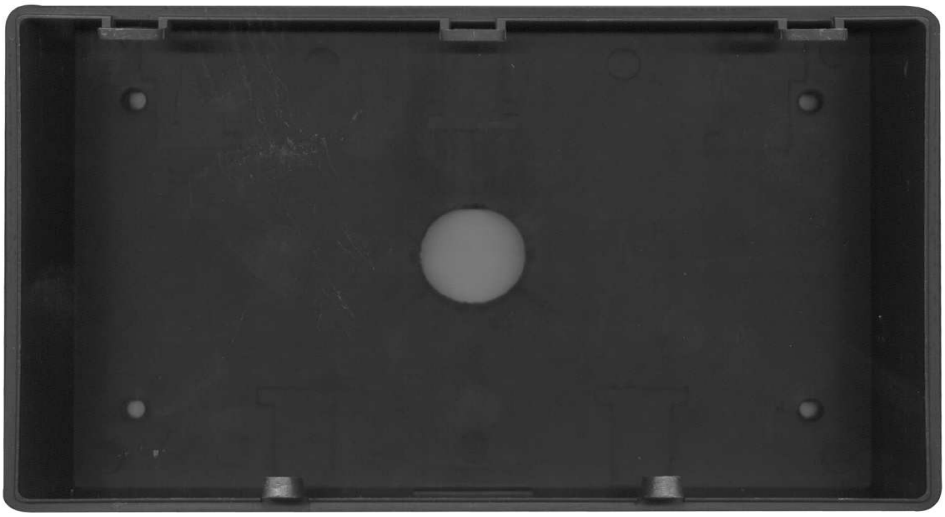
I. RS-485 Mode Control Flowcharts

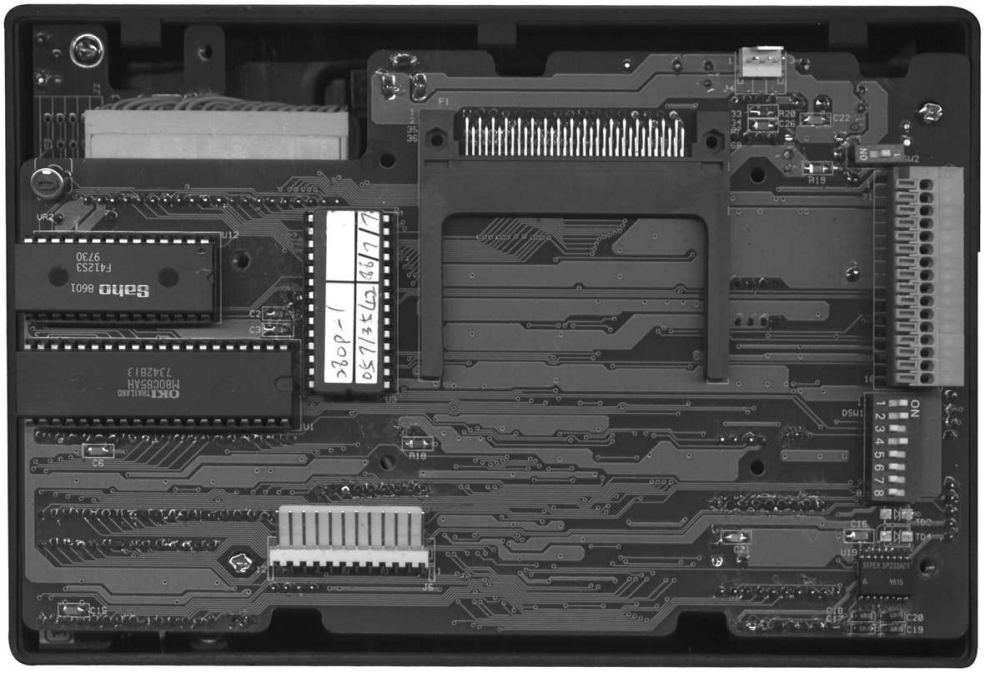

START
YES
Check address 1
NO
YES
Check address 2
NO
YES
Check data
NO
是
Save data in buffer temporary (Data 0 ... Data n)
NO
Yes
Check sum
DO
Yes
Return


DO
NO
Check command "A"
yes
Answer=0-1
0 data present
1 no data
NO
Check command "C"
yes
Set transmitting flag, return to main program & resend
NO
Check command "O"
Check if transmitting flag is set,
then delete noe data. If not set don't delete.
NO
yes
Check command "T"
Input 13 digits of new time
NO
yes
Check command "E"
Read current time, total of 13 digits
NO
Check command "M"
yes
Input 4 digit music times maximum of 30 sections
NO
Check command "K"
yes
Clear music times
NO
Check command "L"
yes
Input 4 digits of shift function time
NO
yes
Check command "S"
Display message on DM-280
NO
Return

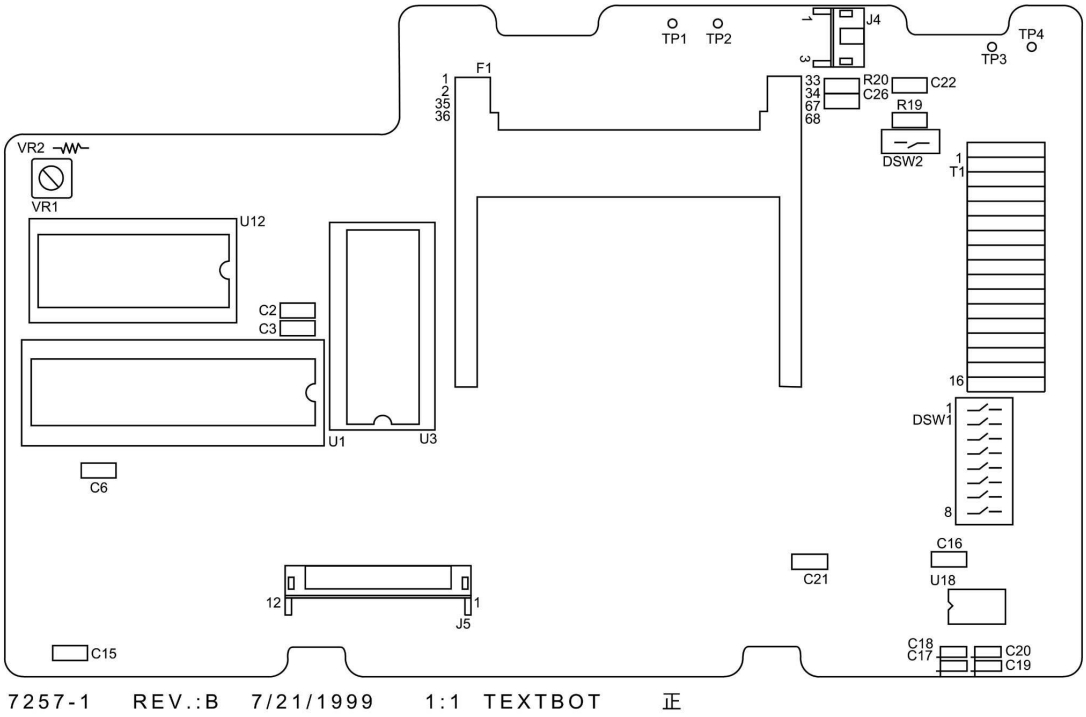
IV. COMPONENTS OF DM-280

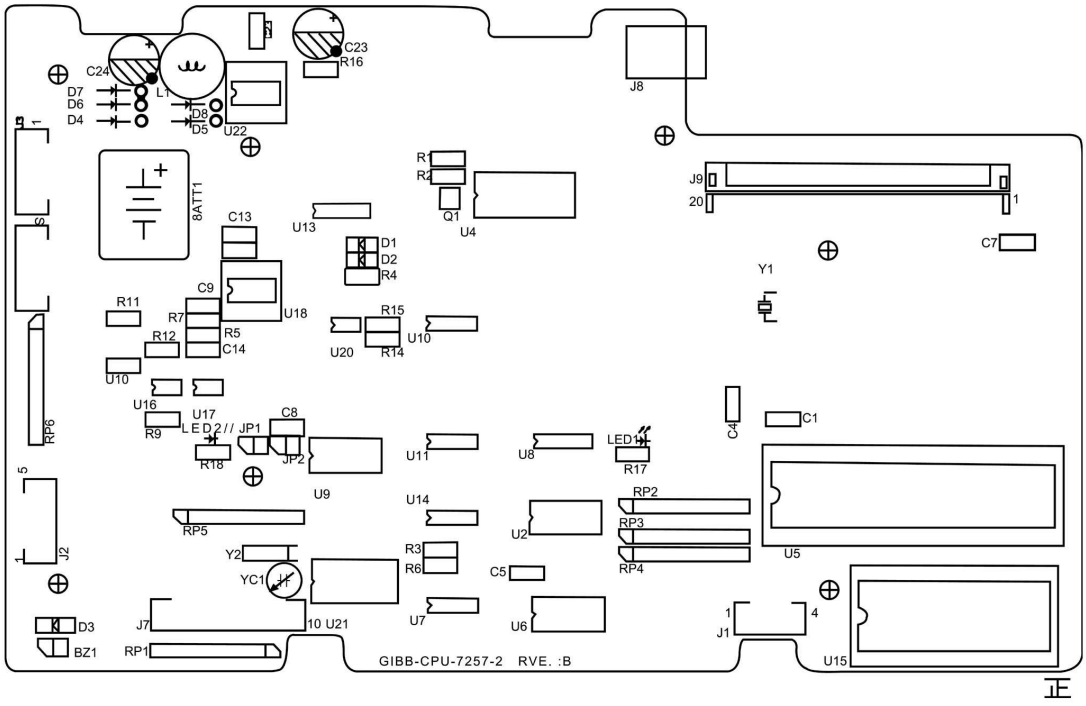
A. Underside of bottom cover:





B. Chassis Mounted Components





CPU

J1 (micro 4 pin) Barcode reader connector

Pin #1 +5V (VCC)

Pin #2 DATA signal

Pin #3 NC

Pin #4 GND

J2(micro 5 pin) IC card reader connector

Pin #1 +5V(VCC)

Pin #2 GND

Pin #3 RXD

Pin #4 TXD

Pin #5 INT

J3 (micro 5 pin) Proximity Reader connector

Pin #1 +12V (VCC)

Pin #2 GND

Pin #3 Reader head READY signal

Pin #4 Reader head DATA signal

Pin #5 Reader head CLOCK signal

J4 (micro 3 pin) Power Supply input

Pin #1 +12V

Pin #2 NO connect

Pin #3 GND

J5 (micro 12 pin) Printer connector

Pin #1 (STROBE) Low voltage action

Pin #2—Pin #9 D0 D7 DATA BUS

Pin #10 BUSY

Pin #11 GND

Pin #12 GND

J6 (micro 5 pin) Magnetic Reader connector

Pin #1 +5V (VCC)

Pin #2 GND

Pin #3 Reader head READY signal

Pin #4 Reader head DATA signal

Pin #5 Reader head CLOCK signal

J7 (micro 10 pin) Keyboard Interface

Pin #1 input data 0

Pin #2 input data 1

Pin #3 input data 3

Pin #4 input data 4

Pin #5 output data 0

Pin #6 output data 1

Pin #7 output data 2

Pin #8 output data 3

Pin #9 reset

Pin #10 GND

J8 DC-JACK (Power supply input)

INNER : +

J9 Display connector: has a one-to-one relationship with display

F1 RAM card input port.

T1: Pin definitions

Pin #1 +5V (VCC)

Pin #2 System 5V

Pin #3 GND

Pin #4 RS-485 RS-422 TXD+

Pin #5 RS-485 RS-422 TXD-

Pin #6 RS-485 RS-422 RXD+

Pin #7 RS-485 RS-422 RXD-

Pin #8 GND

Pin #9 RS-232 TXD

Pin #10 RS-232 RXD

Pin #11 Outside bell/music (TTL signal output)

Pin #12 GND

Pin #13 Outside electric lock (TTL signal output)

Pin #14 GND

Pin #15 TCP/IP RXD

Pin #16 TCP/IP TXD

VR1 Adjusts backup voltage. Also connects with RESET input of CPU
VC1 6242 Quartz clock adjustment. Use frequency counter to Pin #1 or TP1 terminal, then adjust to 1 Hz.
DSW2 must be shorted for back-up battery (3.6V) to allow memory back-up, and for quartz clock to continue keeping time in the event of a power outage.

C. Connection of External Music/bell

In order to signal shift/break beginnings and endings a music/bell system should be connected to the DM-280 Time Recording Terminal. The DM-280 simply sends a TTL signal from pin #11 of the T1 terminal. User must supply his own bell or music equipment. The bell/music should be grounded on pin #12 of T1 terminal.

V. RAM CARD (optional)

A. Introduction

Note: RAM CARD is a standard PCMCIA Card, PCMCIA 2.01/JEIDA Compatible .

Static Random Access Memory (SRAM) card's maximum addressing capacity is 1024 K bit (128K) at present.

On back of card is a write protect switch. Turn off before inserting in DM-280. When not in use, this switch should be set to on to protect the data from being overwritten.

This RAM card requires a lithium cell (BR-2325) to save data written to the card. If the battery needs to be replaced, make sure that the new battery is the same type.

Insert the lithium cell (BR-2325) before using the RAM card. Turn the card upside-down and find the groove for removing the cell holder. Pull out the holder, insert the lithium cell with the plus (+) side UP, and push the holder back into the case.

CAUTION: If the plus (+) side is not facing up, data will not be saved.

The DM-280 has a low-battery detection circuit for the RAM card. If the battery's voltage is less than 2V, three beeps will sound and the LCD will display.

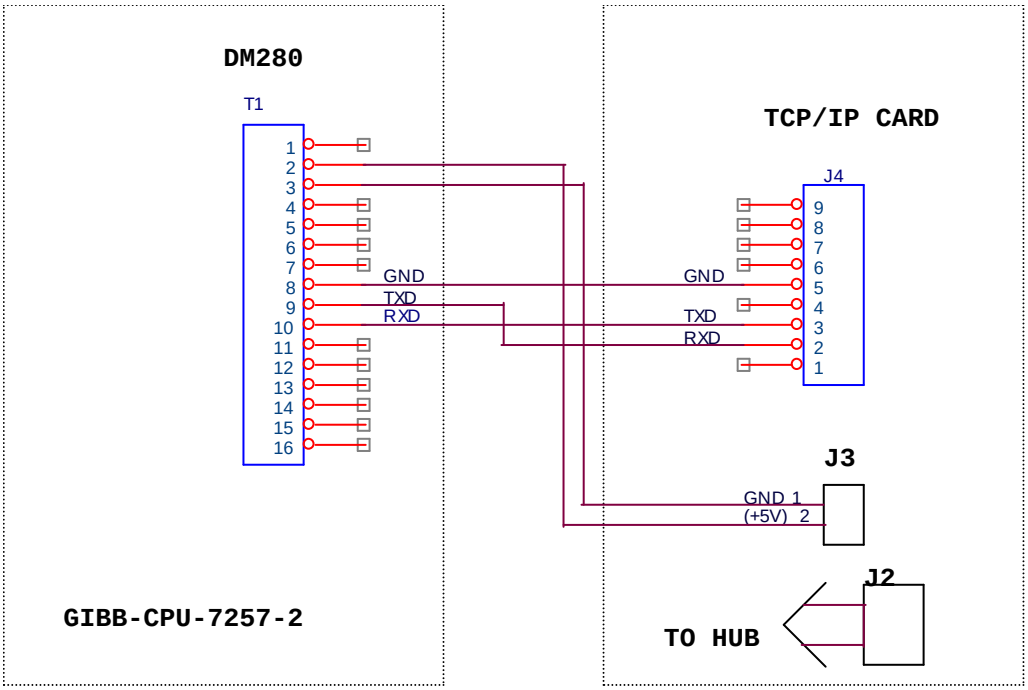
If the RAM card's buffer's are full, the LCD will display.

Replacing the lithium cell

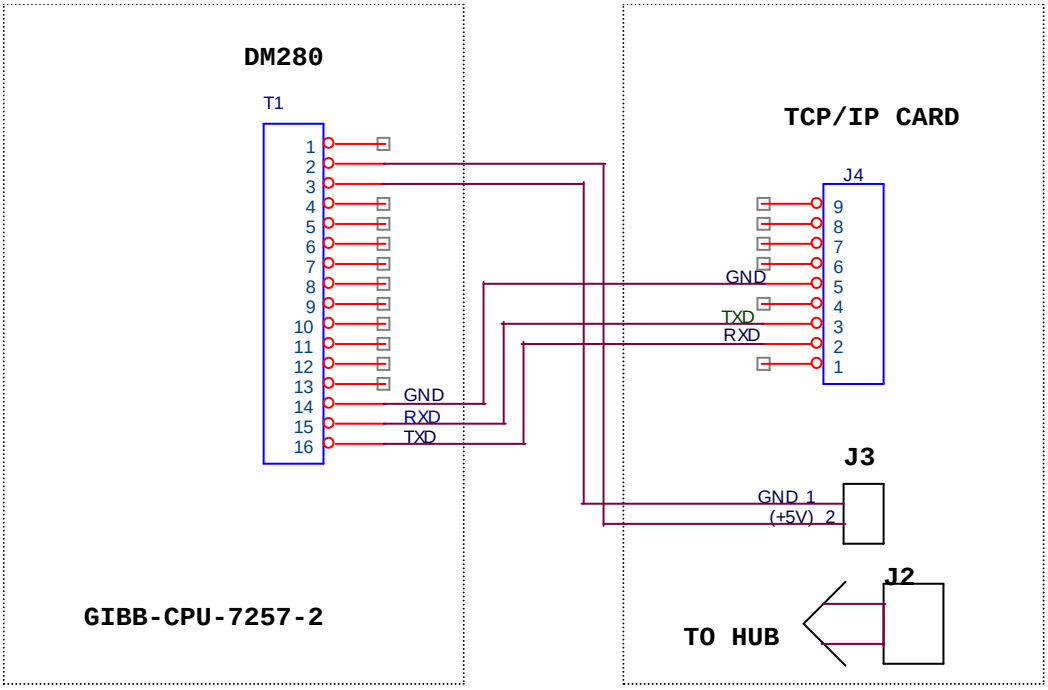
The life of the lithium cell depends on the amount of data in memory and usage temperatures. Cell life is shortened by high temperatures over 40°C.

VI . TCP/IP CARD (optional)

WIRING between DM-280 and TCP/IP, DSW1 should be set #2 ON,#3 OFF, #4 ON



METHOD 1



METHOD 2